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K. M. Waage

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Czhon City Area

Oil Creek Section (continued from Nfld 1956 1)

Section offset to S, first outcrop below [illegible] plan #3,5 Sandstone (cliff) on left bank Nfld 1.

4,3 Sandstone, red, sandy, quartzose, upward into silty [illegible] clasts, rare green [illegible]

1,3 Sandstone, silty, [illegible]

2,5 [illegible]

10 [illegible]

8,0 [illegible]

Section [illegible]

CLIFF [illegible] Sandstone, [illegible], quartzose, [illegible], green/white calcite veins throughout. Base

soft ss weathers yellowish. Some fine soft silty beds in lower part. Loc. Some shale clasts at very top

disconformity

6.0 Sandstone massive, brn weath. fine to med. with loc. pebble, at base and 2' ± lzg cgl clasts on top.

Offset to Canyon mouth for measurement Skyline, Glenerin + Dekoda

Strata E wall just where Lytle goes under wash to S. Here Lytle is gray white, calcic, soft with carb. X lamin. + pockets locally.

Top Lytle on up.

B (1) 20.0 Sandstone, cross-bedded, fine to coarse-grained, calcic at base locally. Lies in irregular channels cut in Lytle & varies considerably in thickness.

B (2) 0.3 Dk gray argill. siltstone, carb

			frags.
B	③	1.7	Sandstone, fine-grained, hard ledge - gray from carb frags, weathers brown.
	④	1.5	Shale, grading downward to siltstone Sh. 0.3 at top, carb, to. Slt/st. with carb flecks
	⑤	4.0	Sandstone, locally 2 double ledge with somewhat silty, platy zone in middle. Chiefly fine grained & medium gr. with upper surface OB stain & has scattered chert, quartzite pebbly granules (in about upper 1") remainder of unit weathers buff.
	⑥	0.7	Chiefly obscured, some silty blt sh at top then silty gray fine gr ss below mostly carb frags & mottling carb.
	⑦	3.4	Sandstone, fine to med, with upper 0.5 calc. chert & qtz granules & small pebbles.
	⑧	0.6-	Quartzite med gr sparsely calc. weathers OB & forms

			conspicuous cap on ss below.
B	(9)	4.5	Shale, dk gray to black and shaly siltst. dk gray weaths light blue gray. Some interbeds fine gr ss. Partially obscured siltst predominates except in lower 1.5 where 2 beds bl. sh and 1b ss. This unit changes from silty to sndy in upper 1.3± & grades into ss above
	(10)	7.9	Chiefly fr[illegible], ~~sandy~~ shaly buff sltst, ss in beds 0.1 to 0.6 capped by more resistant bed 1.5. All fine gr. silty in lower part where it grades to unit below.
	(11)	3.8	Shale, fissile black slightly silty 1.2± above, 0.5 bl. shly siltstone at top, 1b argill ss in lower foot.
	(12)	3.1	Shale, black fissile, slightly silty. with 0.2-0.3 concretionite at top and thin one at base.

(13) 9.6 — Sandstone, fine gr, buff weath, cvcr bedded, loc gross x bdd 2 beds to 1.5 but generally less commonly silty in lower + upper parts, more friable than ledge of ss above. loc, lam, + x-lam.

(14) 0.8 — Silt, sandy, shaly, argill, minor silty sh. ptngs

(15) 9.8 — Sandstone, fine gr, occ. coarse thin bedded, few platy zones buff to brn weath. Forms cliff, locally ledgy.

(16) 4.5 — Shale black, fissile, with, thin interbeds blue gray weath siltstone in upper. 0.5 (and locally thin silty ss. for another 0.5 above the base overlying ss. lifts) Porcellanite 0.7 from top with 0.4 tough argill silt beneath

10.0

(17) 5.0 — Siltstone and fine gr ss interbedded with bl. shale shale. Commonly about 0.8 bed. silty ss or only silty at top + base. 0.8 is

B

		locally ss with carb. cem. silt & ripple mark. to make it whitish. All beds with carb. cem.
(18)	23.8	Sandstone, fine grained, calc. loc x bed, has local platy zone 14.5 to 17.1 carb. base, weathers buff,
(19)	3.2	Interbedded, silty ss, & bl silty to sandy sh & shly silt stn
(20)	0.9	Sandstone, irreg bed., loc. silty with 0.3 czp Fe brown qtzite,
(21)	2.2	Shale, silty fissile black and [illegible], shly bl siltstn. 0.2-0.3 sandy siltstn at base, 0.3 lam. fine gr qtzite at top.
(22)	15.5	Unit is thinly interbedded laminated dk grey to black shale, silty sh with laminae & v. thin

22.0

interbeds silt, and thin quartzitic. lam SS. Lenses up to 0.4 but av closer to 0.2, weath Fe brown with worm tracked bedding surfaces, locally SS weath with greenish cast.

(23) 4.0 Sandst fine gr, lam to cross-lam in beds, rare up to 1', some silty, platy beds in mid part, weaths buff with brown mottling

locally about 1.6 to sndy sh + ss above this to base massive brown sndst.

Base Dakota

Offset section across disconf. + into "Skyline lens" Measuring down from base unit B(9)(-4.5 shale) above. Note - bentonites in this lense.

0.2 cgl ch

2.0 1B SSd dk grey Sh, bent 0.4, 0.8 (locally double Same gyp in sh.

0.6 – Shale dk gray with 0.3 bentonite in it.

3.0 Sandstone fine med, cgl on upper surface & upper foot is cglte. Upper 0.6 loc. qtzite, upper 1.5 has loc. sandy shpts between beds.

1.8 Siltstone, sandy, carb.

2.0 Sandstone, massive, buff weths. fine-med, cgltic in upper 0.4

Outcrop is W side of canyon. Starting at base of massive Dakota. Here Dakota cuts more deeply into Glencairn shaley qtzites - only about 4 ft of them to shale below.

~~56.0~~
50 ± Sandstone massive cliff in lower part, upper grossly X bedded to varying depths. Has about 0.5 ± basal cgl, commonly friable

this includes pellets of porcellanite! as well as scat cht & qtz

9.3	Sandstone in bnds to ylsh brn 1.0 to 4.0 which locally x bedded + have texture sndy shale lzt. between here. Fine gr lt buff.
2.0	Sandstone, fine gr zvgill & silty at top & base, local zvgill silt wcth lite blue gray at base.
3.2	Clay-shale, subcond, silty dk gray lower 0.5 clayey silt. grades to sandy at top.
1.7	Sdstone, fine gr, zvgill matrix - thickens slowly strike or thins & bel below either incised or joint bed above, weathers white, yellowish stain

2.5	Sandstone interbedded with sandy gray clstn. SS is zrgill, fine gr, locally gets lodgy as SS below
2.6±	Sandstn fine gr zrgill top + base weathers lite gr with some OB stain, yellow, + some pink on top. Grades up into flinty clstn above
2.4	Claystone, gray silty grading to ss below (thru 0.6 zone of sandy clstn in interval below.)
1.0	Sandstone, fine gr, zrgillaceous gray weath some pink + brn stain
2.0	Claystone very silty to silty, conch fracture. local sandy zone in middle.
19.7	Sandstone, single massive lodge rel even bedded X-lam butt to brn.

2.0 Shale, dk, to bl, laminated hard, splintery, ~~same~~ silt laminae

1.0 Sandstone, fine gr, silty, loc. argill.

0.7 Interbedded silty dk gray sh & siltstn, loc. bl, fissile

0.4 Siltstone, hard, argillaceous. dk gray

1.6 Siltstone, argill, dk gray & silty shale. Streak porcellanite 0.7 from top and a big one from 1.0 to 1.4 from top

1.4 Siltstone & silty ss, platy, laminated, weathers platy gray.

1.6 Shale, fissile, dk gray plastic with 0.2 porcellanite at top,

0.3± Platy bed fine ss brn. gy

11

zrgill. clay w/ wd, top surface
weaths brn wit OB splotches,
center part light gray
Th. 3 yellowish czsl - becomes
Top Subsoil silty downward basal Cil
on top porcellanite is black
zrgill' siltst.

Slope wash on bedrock?
yell & gray crumbly.

Canon City area, Sand Creek section.

0.8 to 1.2	Siltstone, platy, argill. dk gray weaths in slabs, basal 0.2 ± is bl. highly silty sh.
0.3	Porcellanite
1.1	Interbedded argill. siltstn + silty bl. sh. Siltstn hard dark gray loc sndy. 0.3 bed at base.
1.7	Shale, black, silty fissile becoming siltier downward becoming hard dk blu. weath silty in basal 0.3
5.0	Sandstone, fine-gr- to silty thick bedded, dk gray at base becoming white above, in bed 2.0 ± 1.0, weaths mottled OB + brown
2.1	Siltstn, argill, shaly hard to mass v.f. gray black, weaths blue-blue gray.

7.0	Sandstone, fine gr even bedded, lam, with lam. & thin beds silt & bl. sh & sh silt. In beds 0.2 to 1.0 thick forms slabby ledgy cdcrop, weaths olive brn
50.0	Sandstone, massive x-lam to x-bd clay chip fills, med gr, scour reuse gr streaks in upper 6 ft, below silt, med, fine & coarse x beds. Weaths buff to brown. Reuse zone with some clay pebbles as fr. top. Basal few ft of has coarse pebbles loc, fine cgl.
0.6	Interb. of bl. sandy pyr fis sh & silty sh
7.8	Sandstone in ledgy massive beds, loc, silty, loc, dk gray. Weaths buff & OB
4.0	Silty bl. shaly minor silty sh. with 0.2 parallel bed at base.
2.6	Interbedded black [illegible]

shale + clay. siltst. with thin greenish brn. weathg fine-gr qtzitic ss layers. Latter 0.1 ± about 25% rest mostly siltst.

2.5 Interbd'd grn-ish weathg qtzitic ss layers up to 0.3, & dk shaly siltstn, 50-50 to lgr weathg rusty brn & gray resp.

2.0 Shale, black silty, fissile, with upper 0.5 chiefly siltstn as above.

3.6 Interbd'd siltstn, bl + gray, shaly, thin bedded, with interbeds bl silty sh + some thin ss beds comng ± about 4' from top. Some of thin siltstns weathy rusty with grn-ish cast. One at top weaths blue. Passes into black silty sh thru bezel 1.5.

13.7 Shale black fissile silty with thin interbeds siltstn in lower 3'

3.3 Shale, black, fissile

15

2.3 Siltstn, black, sandy, crumbly ledge, hard, chippy, weathers bluish with brn + greenish mottling, Some ss.

1.8. Shale, black, fissile, silty with thin silt interbeds possibly parallel. Shrad. 0.3 from top.

0.6 Siltstone, sandy to silty hard weath blue gray brown mottling has 0.1 parallelsuite at base. Grades to bed below

14.2 Sandstone, fine grained, buff to brown weathy. Upper 4'± to silty with some siltish ptings becoming, platy to flaggy downward, x bedded loc in thin to med (0.6 beds) sheets - full of ripples and worm casts.

3.3± Sandstone continuous with above but more massive, loc. silty and

argill.,

7.1 Interbedded, gray to bl silty sh and argill siltstn 0.2t pebbly sandstone at top, and thinner one on silty layer 5.2 from top. Siltstn beds chiefly in lower 4'.

16.0 Sandstone, fine gr thick bedded to massive x lam. Ldg cast? or tool print details on surface 5 from top. Platy break on this layer

9.5 Sandstone, laminated fine gr interlaminated dk gray silt + some interbeds shaly silt. Laminae chiefly irreg. Some fine ss beds, All irreg thin beds) weath gray to OB, but dk sh on fresh cuts

6.4 Sandstone, fine to med gr., irreg thin bedded in upper 3' somewhat massive below. Basal 0.8 is calc ss thin irreg

17

	some scatt. pebbles in lower 3'. Silt to pinkish buff down.
14.0'	Sandstone, mass. to, k/z-m cgltic, wet is brn to yellow brn.
3.8	[illegible]
1.8	Siltstone, f fine ss, common lgy gray white - yellow stn.
3.0	Obscured to petch silty green claystone.

[Joe Gregory]

Colo. Spgs - Fountain Cr. section (with Joe G., June 30)

Top section 0.3 bent about 1.0 above 0.4 silstone on top 1st SS - then gyp above it, thin one, 8"

Shely? layer 1 2' below top of upper SS coarse SS & what looks like fossil roots. Sampled

North of Fountain Creek -

No undisturbed exposures of enough of Dakota-Purgatoire-Morrison to make it worth measuring a section.

Como Bluff, Wyo. + vicinity

Como #1, Sec 17, N. center, T22N, R 77W.

Como-1 About 400' S of [illegible] top bluff
Top of bluff qtzite float

D	3.0±	Rusty wea. qtzitic, fine gr, chalky cem brn ls ss
C	6.0	Sandstone, fine gr, white friable in upper 1 to 2, grading to sandy clay stn + clayey ss. becoming sndy, equiv at base, wea light gray white
B	18.5	chalky obscured, slope weak on Vav. clay, sandy at top, lower 7' has prominent pink bed.
A	3.0	Sandstone fine grained calcareous Weathers dk brn to YB with local red stain

The qtzite at top is cemented [illegible] x bedded to cross ss. It is lens Lyte equiv. how thick is qtzite C + D Probl. Sand ss with local qtzite.

Como-2 About 300' S of [illegible], beginning at base ss of A in Como #1.

46	8.5	Clay stone, drab to black, silty in lower part upper 1.5 to 2 is red, white green

45	0'- 3.0	Sandstone, fine gr. gray with greenish cast, massively x laminated (lens)
44	6.4	Clay, [illegible] drab olive clk gray to black
43	2.5	Sandstone green, fine grain, qtzitic (lens)
42	10.5	Clay, [illegible], silty, drab, with lower 3 or 4 ft blk [illegible] bed to [illegible]
41	20.5	Clay stone, hard, [illegible] with [illegible], silty to very silty, greenish gray with yellowish cast. Upper 2' ± is clayey siltstone.
40	24.0	Clay stone, silty, drab, with about 10 ft sandy clayey siltst at top, grading to drab to black silty clay base few feet of a drab shale with bentonite shale at base

39	2.6.	(Concretionary?) layers flinty, claystone light gray to dk green, in 2 ledges with bentonite between. Upper ledge 1.0 then clay with bentonite, then lower clay stone 1'±.
38	3.2	Clay stone bentonitic becoming dk gray & shaly below with hard lgn gray clstn at base 0.6.
37	3.0	Drab to black shale.
36	3.0±	Concretionary brn weath zone 1s with blk to gray chert.
35	7.5	Claystone shaly to shale, silty, drab, local gelatinous stain, all weath light gray
34	4.7	Claystone, silty, black grading to gray downward.
33	3.6	Claystone, clive drab, silty, becoming progressively siltier to base with higher silty, blocky to shaly
32	0.6	Bentonite, about 0.5 silt Below it in addition

(Correct to approx. pos. of beaut.)

31	4.2	Claystone, black with grayer interbeds in lower part,
30	50.0	Chiefly drab claystones varying from gray & olive to black with some brn weath rock ls., locally getting greenish where silty or sandy. Few thin rock ls. at base.
29	9.0	Claystone, greenish gray, brown, progressively more silty & sandy downward, lower 2' subcalc., loc. clayey grnish silts with thin brown weath cap.
28	14.5	Clay[illegible], greenish gray silty at top, grading to greenish gray & med gray limestone. Lower 5' is hard nodular ls. bed, weathering with purple in lower part. Only nodules of hard claystone at
27	9.0	Mottled purple and green

claystone, many nodules, calc, in upper half, scattered calc. in lower half, 3' from base some big nodules, loc. cones. below this nodules sparse.

26 10.6 Claystone green, sandy with interbeds x-ism, calc fine s. which weathers to form brown cubes of calc spar. Also some calc nodules in upper part sandy sand only in middle 6' lower 2 is claystone with calc nodules - local cavity fill.

25 5.5 Claystone purple mottled gray scattered nodules.

24 1.0 Claystone, salty dk green gray.

23 1.5 Sandstone fine gr x-bedding brown weath SS, lt green when fresh, Calcareous

22. 11.3 Claystone salty and some sandy Siltstone near top. silty, mostly green & purple, scattered calc nodules

and in lower foot± crumbly nodular limestone.

21 5.0 Claystone, dusky red, very silty to cl. silts to lite reddish orange. Some green mottling. At base is 1.5 green clasts with calc nodules. Locally a ss, clay, bed some into green beneath.

20. 13.0 Claystone, silty, purple, calc nodules. Bottom 4' is green nodular, siltier, some purple bands.

19. 1.2 Nodular limestone, ... brown, ... under. ... X bedded calc. ss, ... to ... 1.3.

18. 1.7 ... silty, ~~dk red~~ green

17. 7.3 Clay... purple grading to dusty red, silty to ... local limey ss lenses, at top is 2'+ 0.4 – 1.0 Conc. limestone.

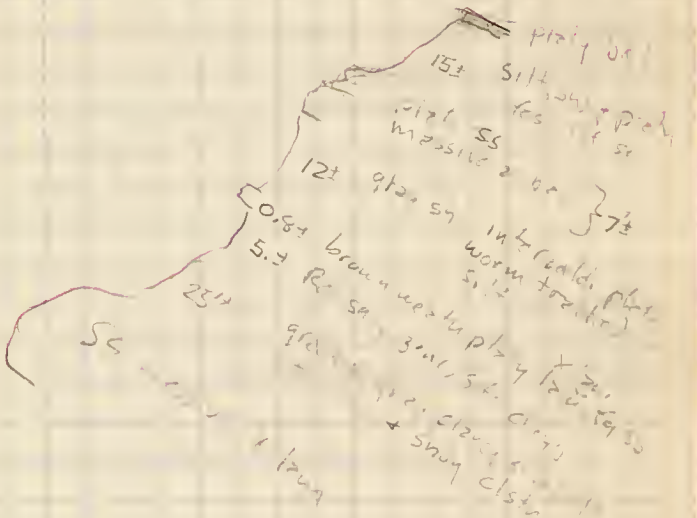
16.	0 - 4.0	Sandstone, massive bc chiefly lam + cross lam.
15.	4.5	Clay[illegible] silt, chiefly green, purplish red towards top.
14.	0.7	Sand[illegible] fine gr. x l m
13.	17.0	Clay[illegible] sandy, to silty very dk green becoming lighter upwards, some sandy zones.
12.	1.5	Sandstone massive x lam very calc. some clay pebbles
11.	3.6	Clay[illegible] silty, chiefly red some green.
10.	up to 3.0	Sandstone, massive, lam x lam calc. brown weath.
9.	11.4	Partially obscured, chiefly greenish gray, some lam, pebbly at base with ripple marks seen in float

8.	1.0	Limestone gray, granular crystalline, greenish cast.
7.	8.0	Marl, var, gray, reddish & greenish gray, with calc nodules up to size golf balls & bigger.
6.	0.8	Limestone, greenish gray
5.	3.0	Interbedded, siltstone, lam, silt, lam and dk gray clay, shale. Nod. is 0.4 about 0.8 diam.
4.	2.7	Olive gr, silty clay/sh becoming darker downward
3.	11.0	Sandstone, gray, vcstn, f-m-gr, ~~lam~~, calc. cement, shaly, friable. not prom. ledge, but some ledge.
~~#~~ 2.	13.0	Shale, dk clay, some sandy silt layers Psch. ruthis densus
~~1~~ 1.	0.6	Sandstone, platy, weathers olive, lam. fine

Sec. 1, Nat. T__N, R. 77 W

has U shaped worm? tubes
11 beds exp.

Below this section roughly



Como #3

Appr. [illegible] of gt 3ft
& sdl white ss, = 27'

Then 10.5 of variegated sandy
clayston + ss, bottom 3 reddish
ss clayey, then ch. 1'
grayish clay-ston grn. tint silty
at top it's gray white with
yellow to red stain.

Above this about 1' bl. gray sandy
+ thin wood with warm brn. clay
then purple brown ferruginous
layer, 1ft calc, may be
concretions.

Compare this with Como #4 p. 30, which
is further north where road crosses bluff

Como #4 — Sunday morning where road crosses N end of bluff in S½ Sec 12, T 22 N, R. 77 W

Thick Lyt.-like sec N of road measured starting on most prominent pinnacle.

From sandy yellow weathered base ledge

E. 48.0 Sandstone, massive, x-bedded, white to light gray, ½ conglomeratic, chiefly in lower 20', some red zones above. Weathers typical Lytle. Has Fe-stained upper surface.

D. 1.0± Clayey, light greenish gray silty

C 4.7 Sandstone, fine-grained, gray-white. In beds up to 1.0' with at least one greenish clayey zone. Fossiliferous base. Weathers yellowish gray white. This unit

has Fe OB weath cap, irreg
worm marks

B 14± Partially obscured, clayst & fol biot over light-colored vesic-grad clayst, ch grnish gray with some lgt brn stain in lower part, upper part [illegible] ss. incl some thin [illegible] fine-med ss.

A. up to 3.4 Zone of chert nod ss. May be [illegible] and lie within the ves. clstn or be continuous layer from 1 to 4 thick

Offset NE on road N side hand leveling up

From top of massive lgt gry to ground is 37 feet. Lower 20 is similar to unit C above, with minor amts ves. clstn. then a 17' zone of ves clstn, chiefly bright green but ves to grezl, laterally. This capped by purple brn weath fine-gr to coarse ss which varies from 0.2 to 2.0 thick, is locally coarsely cgltic & also may have

no cgl. wkz sorter.

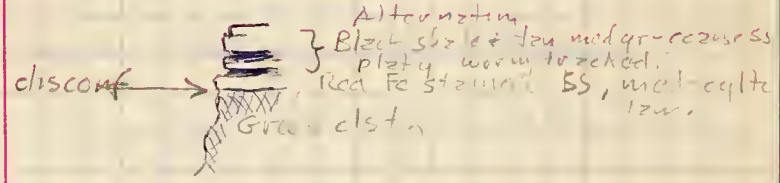
It is in soft zone below this layer that big chert lenses come in laterally at diff. positions. Locally 3 of road there are 2, some come right under dis cont.

Float of grey well rounded chert pebbles + some chert "gastrolith-like pebbles. These seem to locate sparingly below the purple brown layer in upper part of claystone. Locally the basal cgl has rounded chert pebbles up to 4.0 diam but not as smooth as "gastrolith" like pebbles.

Purple brown layer commonly with broad ripple marks + wave trails, cgl is mostly in pockets + pebbles. Locally weathers more tan than P brown and more ash with tan weath layers similar ss.

Near road, N. side, no gastrolith zones, instead some lenses calc ss in upper 17'.

Ditch crop N side road shows contact. →



To east long slope terminated N.
of rocks by low subsiding ridge
of massive X bed SS - with
ripple marked channel bottoms.
Men by Muddy

Northwest of Rock River, Wyo, NE bluffs of Rock Creek

¼ NE¼ Sec. 28 T. 22N R. 75W.

Top of Thermop. in to Mowry

Station at shale beneath etc.

12.	2.0 – ?	Covered
11.	5.2.	Shale, blk fissil lam. Izumi silt loc and some thin interbeds silty and fine gr. ss.
10.	1.3	Sandstone fine gr. + silty irreg mtx conc and silty clasts. Forms cuesta ledge gray to blue gray yellow blotches. Locally has hzd resistant ss at top
9.	1.0	Shale, black fissile
8	0.4	Ss similar to above, locally hard
7.	0.4	Blue shale grades to ss with some lite grey shaly clayey silt

6.	1.0	Crumbly argill. siltst. [illegible] ss irreg interlam to lam, some [illegible] pores.
5.	0.4	[illegible] ss lens irreg interlam, bioturb loc.
4.	1.3	Shale, blue-grey, [illegible] at top grading to silty and sandy shale + lens argill shly sandy siltst, grey.
3.	0.3.	Bentonite
2.	0.8	Shale grey, [illegible] lam (<0.1) bed blue clay stone at top
1 covg.	—	Shale [illegible], weathers silvery grey [illegible]. This is quite thick. Usual measured — stone hills for about 25', forms characteristic "white" zone in landscape.

Offset to section 4, measuring down into Thermop.

2.5 Bentonite (Same as unit 12 preceding section)

1.2 Conc. [illegible] Fe + Mn

1.1 Siltstone, + siltstone [illegible] interbedded [illegible] silt

3.7 Shale [illegible] [illegible] [illegible] shale [illegible] silt, [illegible] 1.5 [illegible]

0.8 Siltstone, laminated [illegible] [illegible] [illegible], [illegible] to 15 [illegible] [illegible] [illegible] resistant silt to [illegible],

0.6 Shale lignitic ~~[illegible]~~ some [illegible] [illegible]

1.0± Claystone, gray to black and siltstone interbedded [illegible] [illegible]

3.4 Shale, silty, [illegible] [illegible] and [illegible] siltstone [illegible] beds. [illegible] [illegible] [illegible] sh

	1.5	Sh[illegible], black silty with 0.1 lam[illegible], yellow wrstn ss at top. Shale becomes silty, tougher downward, loc to blk [illegible] siltst.
2.	2.3	Sandstone, fine gr, silty friable, clayey. Light yellowish gray, (mica in beds) has irreg tubular fillings with shale in upper part. Is very thinly [illegible] Grades in lower foot ± into dk gray [illegible] (Sampled)
1	2.2	[illegible] gray to blk, [illegible]
	?.	Ke. top [illegible]

Considerable thickness of shale, black, below this.

Clover - Thermop. SW Laramie — For Location see Love-Weitz Albany Co. Map. 1953

Loc. 1 Muddy strips just S of road, (T16N, R74W)

A819 Dip 6° (A-819)

Sandstone pebbly to gritty Muddy. 50 ft ± 5% Muddy then 2 ft 33% sandy mudd over 7 ft 2 s.

Dip appears Muddy, with thin sandstone (warm) and more pebbly appearance is produced on the Muddy contact. Lower 5 is mostly S. ripples, current tracks, some ripple marked.

Loc 2 Jointed blocks. Cherty

Starting in upper 12.0 ft Sandstone, fine to

coarse calcite. Cgl locally in base 2.5 thick. Above this thin [illegible] weathers brown to OB.

25 Partly obscured slope, thin gray ss. At 14 fine lap prom. Above calc, conc. increasing content in beds 2' ± asc ledges, conc. chert.

35± Obscured upper part is sandy claystone, lower part has some IBs.

72 [illegible] and conglom. at base, upper part fine gr, med, in slope, [illegible] lower part with thin beds, cgl, gray ss, clasts mostly chert & qtzite, upper 8' [illegible] and more typical white Lytle but with mostly fossiliferous bedding lic. Above typical stuff of Cgl. with some cgl lenses.

Offset of Loc. 2 to N undrawn + on bzch of bluff opposite side of road (L) from entrance to MacDonalds "Lazy Acre Ranch

(= Freyburn member ?)

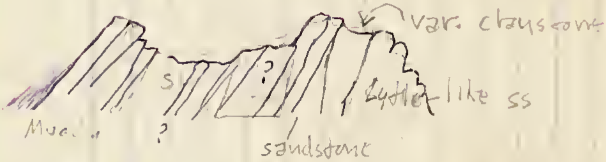
11,0± Slope wash clay, m bl sd with interbeds thin fg-gr ss. Thin calcd layer in bluff at + below base and most ss at top - some qtzite. Green clay in coulee into wash just below base this interval.

34,0 Sandstone, chiefly fine qtzitic to fine bridl in beds to 1'-2' thick but mostly over or under 1ft. with plty seams and some interbeds fissile dk gray-bl. Sandy sh. Ss weathers buff with orange crust - or z yellow brn. Iron stained planes with various "worm" markings.

4,0+ Very plty, fine gr ss greenish cast.

Above this b[illegible] [illegible] [illegible] to [illegible]
Sh. with thin ss [illegible] beds

Loc. 3. Hogback N + S of here is
double. To N. road



Muddy 25' [illegible] [illegible] [illegible]
[illegible] [illegible]. [illegible] [illegible] thin [illegible]
[illegible] [illegible] [illegible] [illegible]. [illegible] [illegible]
cht pebble cgl on top surface
above [illegible] [illegible] [illegible] [illegible]
+ silica [illegible] + siltst.

Sh. beneath Muddy not exposed could
be trenched. N of road in vic. of
gap in the Muddy. The swale
W of the Muddy is only partly
in sh. Sandy beds come in half
across. First some platy
Fe br. weath. thin beds, then
a massive ss bed which
weathers yellow gray to buff

and locally shows weathering out of ss in the vesicular [illegible] color.

Platy ss bed. Resists erosion which is locally the [illegible]. Some cgl at base — typical chert pebble stuff.

Sandstone ledge on ver. beds between top ss and Lytle-like ss. In this zone — from near top (W side) polished pebbles are weathering. None such in basal cgl of upper ss. None seen in place, but it is exactly same position as at Como Bluff.

Here no big chert beds evident, but huge piles of same chert as at Como, some in red-weath. rock, some in pebbles, where pebbles not as smoothly rounded as others in zone.

Dr Knight thinks Clovery pebbles coming from SS. Suppects idea they are from [illegible] not terrace residuals or recent dato.

Typical Clovery - Lorenzo area

Tabular bed SS, local bed
cgl + IB sh.
pebb[illegible] Vavk plrd clsts
chert lenses

Thinner bed w/ [illegible]
clsts ptnd. OB
boiling surface [illegible]

Massive Lydia-like SS
+ conglom.

Laramie area - reconn

Top ss - Muddy, in locally.
Shale - Thermop. - no adequate section of this. Obscured except for hard zones. SW Laramie has calc. cones + platy beds with *I. cunnachezanus* fauna, on W. side Sheep Mt. has considerable ss in lower ½, incl 1 massive bed.
Plainview equiv. - Variable unit in which shale-sand ratio most variable. Commonly with basal cgl.

Disconf. - Commonly clayey dk. brown, brown + buff ss. with dk shale, sm. light gray white ss + var. beds. No exceptions seen.

Variegated zone. Has pebbly near top, local calc ss or lime ~~conc~~ beds, and local over-lies Lytle cgl. Typical but sndy, calc. + clayey + varic.

South of Douglas, Wyo

Mowry - thick typical upper part, thin becomes 1B - Mowry-thermop type sh in basal 2/4 feet approx.

2.0 ± Sandstone, very hard dk gray weath fine gr., sandy, calc

17.0 ± Obscured, approx meas.

1.0 Sandstone as above; interf ripples deformation cracks? on top surface - can't be traced in. may be base. Bed has greenish cast at top surface

7.0 Obscured, about 2' brn sh under ss above thin slope wash.

0.5 Sandstone as above

4.3 Obscured

5.5 Partially obscured, platy hard silty to xln ls in upper

foot sticks out as ledges in wash. Then about 4' below a 1' bed lam. calc. silt with ripple marks. Below this silt. chips in float.

10.0' Obscured. At top is black calc shale but rest of slope mantled.

3.0 Sandstone, qtzitic to uncal, fine gr. qtz in thin interstrat. layers.

B 54'± Obscured - rough weath basal part black fissile sh with lenses OB weath calc. concs.

A 11.3 ft more of blk - sh sem silt near base below this then slope wash.

Possibly fault here which repeats conc zone of B above. Gully full of wash comes in from E and next exposure is on same or conic.

Rancher coal channel is
complete section and 45' I start
between 2 conc zones.

10.5' Shale dk gray clay fissile with
OB. weath zone cones at top
and platy to conc ls ~~s.ltg~~ gray
~~ls~~ at base, Some thin ls
beds scattered between.
ls's weather Fe brown.

5.2 Shale, dk gray clay fissile
few sdst, silt ls layers
as above.

8.6 Siltst and fine gr ss
and shale (platy to crumbly)
and lenses interbeds. Whole
weathers rusty Fe brown
Sdst fine, sort, rnd, some
round Fe concs in ss layers.

1.2 Coal bed
0.1 coal
0.4 lig. shale
0.7 coal.

11.3	Sandstone, run. vgr, silty, in thin beds and laminae, much ripple mk. on surface, with beds + partings sandy shale. Middle zone 2' of thin bedded shale but varies, elsewhere only ss above shale more cross bedded.
0.5	Coal and silty liq. sh.
2.6	Clay, soft plastic gray with coal flecks.
4.0	Concealed, by wash
9.3	Irreg. interbedded silty, locally ~~sh~~ liquitic sh and fine gr ss + siltstn, weathers blue gray and rust Fe brown streaks, + stairstep on harder beds marked by irreg. bedding + rough crumbly outcrop. Some coaly partings.
5.0	Shale, fissile, clay, green weathers yellow to red lower be silty, yellow weathers.

6	1.7,	Sandstone and siltstone, lt brn. ft top. Laminated, cross bedded weathers with tan to pinkish stain, fossil fragments abund. SS in lenses fine - MB with lt. brn lam S. Int some fine ss disc in lam zones. SS is lic inc
5	2.0	Shale, silty, greenish gray some red stain.
4	0.6	Platy siltstone, lam. + ripple marked.
3	1.3	Shale, silty, dk gray, fis. to maroon stain.
2	0.1	Ripple marked ss.
1	5.—?	Shale, grey brn, fossil.

remainder this part is obscured by slope wash.

Laterally to W what is prob omit 6 of preceding thickness to beg even bedded sandstone.

16.6 Sandstone, fine gr - med even bedded lodge.

25.0 Obscured completely by slope wash.

14.5 Sdst, lone, [illegible] gr. thick to thin-bedded. Upper 3ft is qtzic thin bedded vertical fract. prominent then more massive section weath grey white to brn.

0.5 silty clstn + sl. sdy pink.

7.0 Ss fine med massive x bdd weath grey white to pink

8.0 Obscured - may be ss at but looks like sat zone locally

91.0 Sandstone, massive, & lam. fine to med. qtz. some coal & carb. in lower p. of, Some coal in basal 10' too.

Morrison contact obscure
2 limestone beds 50' down,

Cloverly – See Mylo Howe for loc. of old
P.O. – Ed Lewis says he knows.

26
156

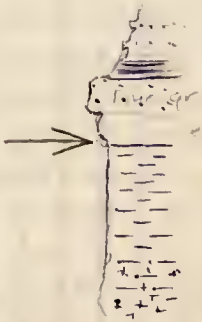
Trip with Doug Kinney, wk August 21

Area of type Cloverly:

Locality
#1. Exposures W. of Beaver Cr. - Bear Cr. rd. opposite old Cloverly.

Section begin in Cloverly - no basal conglomerate showing, much basalt in conglomerate in float on low vegetated clastic knobs in small flat. Above this is brown colored ss. - ~~odd~~ cliff, ~~and~~ then very hard clastics block like weathering. Petrified wood abundant at base of clastic zone with bark. Believe base Cloverly not exposed here.

Top of vegetated zone is contact



Above contact mostly shale with lenses of silty ss. at top some ss conglomerate. Then goes into base

shale. Needs digging for details. At least one bentonite ± 25? above base, may be more. Popcorn over most.

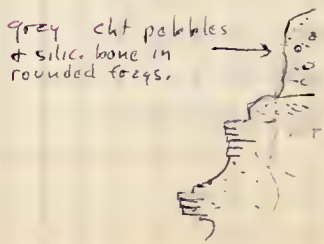
Thick shale section some silty zones & Fe concs.

Rusty beds comprise entire Fall River equivalent at this place. No good ss you could call Greybull.

A820

Platy thin ls of Inoceramus fragments with fossil remains as well upper section 25' under white ss. (Muddy?)

White sandy band is very fine grained below with calc. platy thinly lam ss ledges, wreathing above thicker salt zone reduces ss with dragon polished chert pebbles



52

Above ss more black shale with porcelain like ↑ black ↓ blue chert with bone frags in lower 50± ft ?150± above ↑ zone Festina nice black coal with Inoceramus. (Sample of many small ones. Between here and Mowry sh is siltier loc. 1B, siltst & fine ss and bentonites Sharp change to Mowry but no real break visible. Upper Thermop beds have numerous coals with croc.-like bone frags.

prob less than 100-ft cut

Mowry itself uzuzk gods bad loc. to measure shale and also has 1B ss Return to Thermopolis type of shale due to faulting. Once siliceous type comes in it stays — + sandy beds.

There is no ss at top Thermopolis here. The collection of small Inoceramus worth careful identification, don't look like Comanchensis

Cloverly area, Locality #2, NW cor sec. 17, T 54N, R. 91 W., about 1 mile E ~~Cloverly~~ old Cloverly, in local bad lands.

4.6 [illegible] grayish pk, w. 0.6 yellow clstn at top.

Morrison

Cloverly

8.4 Sandstone, fine to coarse, calc. stringers chert & qtz gran. cgl.

This int. loc. all ss, but loc up. ss shales out.

5.3 Covered - ou[illegible] clays[illegible]

9.0 Siltstone grading up to ss fine to med, calc. scattered coarse grs. massive x-bdm.

5.3' Siltstone & fine gr ss, loc. clayey, commonly covered by popcorn ctz zone 2 above. Is soft & friable weathers white & yellowish.

21.6± Clystone, under dominantly pink to red purple upper 4 reddish at base, some interbed. gray green in upper part.

Abundant chert gravel loc. Cone → in Morrison gray unit

18.0± Clystone under gray pebbly sandstone some qtzite boulders at base. Grades

5'

up to massive siltstone

porcelanitic?

3.5 Siltstone, light gray weathers white. looks tuffaceous

9.6 Clayst... gray silty at bas. locally fragmental, bizarol becoming softer at top. Under gray porcel... sur...

6.0' Sandstone, med-coarse, salt x-bedded, with ... pellets in lower pt. Light gray. Many dark grains.

6.5 Claystone, silty at base, hard dk gray grading up to lighter gray & lav purple cl...

52.0' Sandstone, ± claystone clasts, medium, greenish tan to red, ss. with dk minerals, contains polished pebbles. Grades, in upper ft, part to have claystone with vitreous greenish stuff in it - welded tuff? Sample from Loc 1

pit base

Lunar ss top at about 22' from base

1.0± Sandstone, white coarse rounded with chert

8.5 Claystone, green with purple mottling loc, + some dk red at base. Fuzzy marks of what looks like porcellanite, white, rounded.

9.0 Claystone, ~~as above~~ chalky red silty some grey mottling

5N' Claystone, very silty Grey

18.0± Claystone (or silty) green grading from red below to grey above. Fe pellets below 3' from top. Grey soft clasts at top

Contact

— Fine grained SS. This is friable for about foot then thin Fe brown ledge. To d'NW this becomes massive brown channel sand.

Type Cloverly

Rusty beds not meas.
Greybull

Variegated 163.4

Basal ss (mary) 22.7

186.1

Cloverly at Thermopolis

Rusty 63.7
Greybull 34.2

97.9

Variegated – 67

basal ss + cgl – 72

139

Thermopolis #1 — Side backback Cloverly, first N of town along old highway bed, meets new highway at #2 below.

Here to Morrison ± 200 wl 1 lower 135' mas. ss v-fgm fri gr ss w/m gr cl - pinched into sil sh - and then s stg calc, ltsh, which monotonous no ls or other typical Morrison 11th, Gold. grec wh gray. Appears to grad down into Sundance - S. bnd is a fairly sharp break on basis of differences & appearance glauconite in ss. (photo)

[7427] Thermopolis #2 (Phillips) Road cut 2.8 miles N. Thermopolis on U.S. 20. from State Pk Ent. Start 3' below Cloverly - Morrison contact

Slope cov

1.0 Siltstone, dk gray, x-lam, sandy, some fine-grained ss. Carb flecks.

2.0 Shale, silty and sil stone, sp [illegible] fracture dk. gray carb. flecks. with plant frag. [illegible] like cycad leaves. Morrison contact.

72.0 Sandstone, [illegible] ss forming ledge. Finer

coarse [illegible] x bed [illegible] up to 4' thick, Coarse with some pebbles 1"± in diam. cht + qtzite. Coarse cgl lenses ~~thruout, base 25' bel cgl stringers~~ throughout, matrix yellow-gray to buff.
About 10-18' in upper cgl is green clay inclusions and IB. very red + green clay beds. These local pockets contain polished pebbles. Upper true to medium except at very base where coarse.

50.0+ Clayey [illegible] to sandy very fine grained. Upper 15' is hard, light gray becoming dk gray + purplish in lower part, then red [illegible], dom. red with mottling green, at base 2' + loc. lenses green predom. Scattered coarse cht + qtz pebbles throughout.

5.0 Sandstone, fine gr, micaceous, [illegible] thin lenses light gray some of

12.0 Interbedded clayst and siltstone, sandy. Upper 4' gray clsts cht + qtz in scat coarse grains throughout, becoming silty downward, weathis purplish with red splotchy staining Below this siltstn, light gray with scat grains some granules, loc is silty ss, which irreg interbed + x-bed with silty mottled light + dk gray clsts + clayey siltst. also with scat grains This lower 4' varies let, loc. chert + silt + ss.

6.8 Sandstone, even med fine gr. micaceous, weathis yellow-gray, loc. lam

2.2 Clayst, loc. shaly, gray at top red + purple + light gray, silty at base.

9.0 Sandstone, lam, fine gr loc. shaly with pl. thin interbeds sub-lt gray to dk gray, platy

friable, Loose S.S. massive thinly layd, micaceous interbedded silt & carb laminae remainder platy with lt sh + silt,

8.5 Siltstone, chocolate, massive green, upper foot is red. Loc sand, weathers blocky, l

discont →

17.7 Interbedded fine qu SS and siltstn, laminated, carb and non carb. Intrabeds / to platy, with Fe. impreg in some layers. Upper Fe impreg. weathers

Base 7 single intraformational from top carb shale boundary.

[7427]

23.7 Interbedded dk-gray silty shale, fine gray, + siltstone, massive, shaly + contorted interval below. SS interbeds 0.1+ to 1.0 but most less than 0.5. Laminated, carb [illegible] Thin beds siltst + Commonly Fe impreg. SS where thin silty

9.3
-6

60

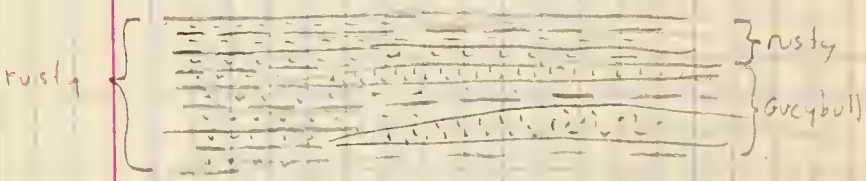
over.

Above this platy silts zone, is dk gray black shale + silty sh with silt laminae, some fe conc. + conc-in-conc.

East of town along oil field road which takes off from city park (turn right instead of left toward big spring.) are best Thermopolis exposures. No section measured. would be difficult to get complete one here. Did see good bentonite about 30' ± above Greybull ss. Cleverly ~~[illegible]~~ along road is less sandy in upper, Greybull part and rusty bed may be thinner. Dug out contact (regional) in gutter, is thin bedded ss + sh on clay stone, much sharper than in Loc. #2 at road cut.

Resume on the Cloverly seen at type and at Thermopolis.

Rusty beds + Greybull obviously are Fall River equivalent. The Rusty beds and Greybull are not separable, because Greybull = local ledge-forming sands in lower part, locally may be all of Rusty zone — viz



Disconformity sharp at type Cloverly, not so in Thermopolis road cut where seems to be set up similar to Lee's Bellvue locality with ss + lb vor clstn at base.

Type Cloverly is in claystone phase. Darton prob. included no Greybull or Rusty in original Cloverly but changed it subsequently — check this against his def. Thermopolis. At type Cloverly little or no Greybull except the local lens, and fairly persistent basal ss

above disconformity.

Morrison contact fairly well-defined at type Cloverly by presence of chert pebble (dom. gray + black) cgl. although this locally pinches out. Below this cgl section varies, may be due to lat change or depth variation. At loc #2 beds below are gray clstn + grade into red clstn below, but just across badlands ~~that~~ on hill due west small butte at #2 thin cgl rests on red clstns with typical Morrison limestone. This appears here to be a lateral gradation. Be on lookout for possible relation between type of beds in upper Morrison + nature of overlying Cloverly SS. Here thicker SS but not as coarsely or much cgl over gray Morrison but thin coarse cgl over red. May be local only but at Thermop. #1 + 2 under thick coarse Cloverly is black clstn with plants (typed here) at to Morrison. And in Black Hills similar setup locally.

North Park Colo.

General set up of Dakota group same as along Front Range. Disconformity is evident.

Lytle:-

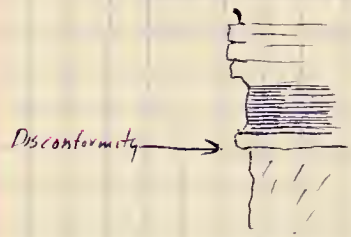
At Dougs locality 20'± of cgl + prob. more claystone. Polished pebbles in float near top of unit and pebbles up to 3" diam. in the cgl. No Morrison contact visible.

At Tom Steven's Dakota section Lytle seems to rest on dk-grey silty claystone — Morrison?

South Platte.

At Dougs locality a little ss in upper part. Looks like Van Bibber member may be identifiable, but needs trenching + careful measurement. Some fossiliferous limestone in float but not seen in place. Marine well developed but no ss not visible, may be some fissile in float. Thick

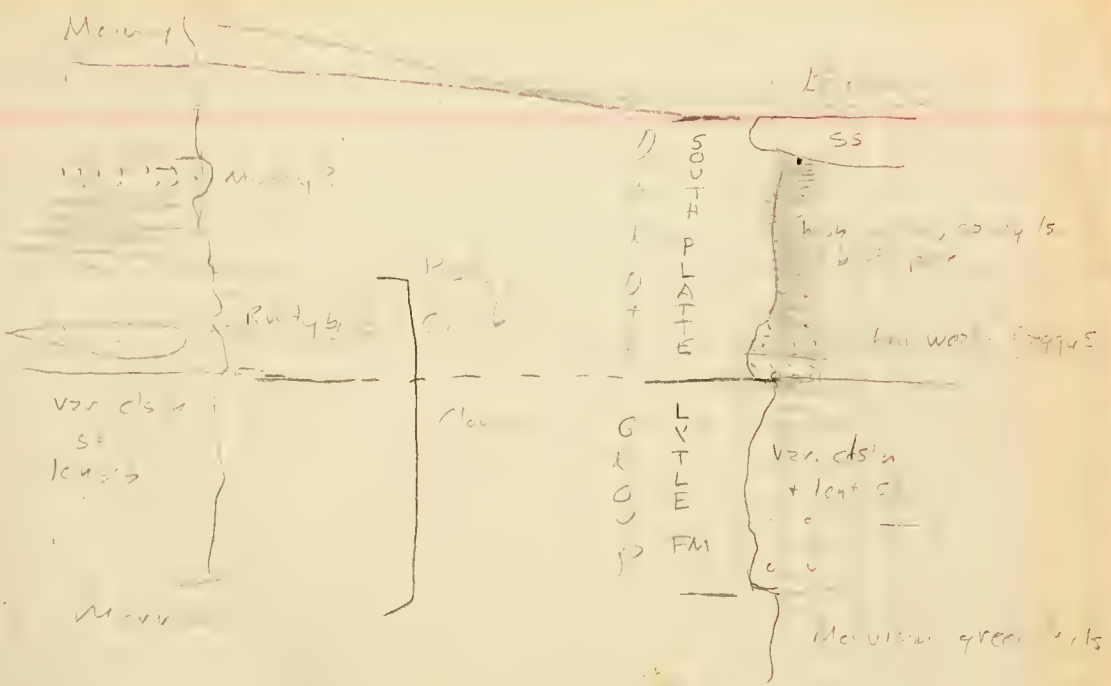
Shale section with concs. and some bentonites. Plainview ss well developed, has coaly shale under it and siltstone or carb ss at contact



At Tom's locality suspect upper contact is faulted as Mowry is next to platy, calc. siltst. with fossils and So. Platte section seems foreshortened. Also dubious of some of his thicknesses. The coaly sh. ~~under~~ Plainview, unmb is 3 or 4 ft thick — not 12 as he has it, black wash coats underlying grey silt in Lytle and makes dark zone look thicker.

The top ss of So Pl — , its absence or reduction is problem. Also fact that Tom + Dougs sections seem different (in So Platte fm.) is odd

and needs study to see whether there is actual strat. change within the basin or whether this is only apparent because inadequate exposure or result of facies in Toms section.


SOUTH PLATTE
LYTLE FM

Cloverly formation - (G.S.A Bull. v. [illegible] p. 32 [illegible])

No details - Mentions only SS (4 to 30 but 10-60) - coarse bare - gray, x bedded, and curly mx "clay", 30-40. Some thin coal[illegible] of coal near base of sandstone.

Lupton, C.T., 1916 (U.S.G.S. Bull. 621 p. 161-165.)

Greybull Ss. - (subsurface unit, no type section)

Lupton says it is upper 20. ft. of

Davis says Cloverly

D.F. Hewett + C.T Lupton 1917 (USGS Bull 656, p. 19)

[Sees the fm. as Morrison - p 19 ref. to Cloverly "in part" - uses fm. name Morrison]

Cloverly "in part" - uses fm. name Morrison

Aver. th. in BHE = 125

Almost plains its lower part is fine white cgl or cgl ss, 15-25 ft th.

middle part is red clay shale and thin b. ss 75' th.

top is 10-20 ft. yellowish gray ss. - "locally termed Greyball sand, and here designated the Greyball ss member of the Cloverly fm., from town of Greyball near which it is typically exposed. [this makes it a legal surface unit, not a subsurface as Wilmarth has it.]

They note Morrison [illegible] from base top of fm. also Cretaceous leaves near Thermopolis. So probably confusion at contact here also.

C.W. Washburne 1908 USGS Bull 340, p. 350 Describes "Cloverly beds" as basal member of the Kootenai fm. says "a conspicuous feature at base [illegible]" "Since only thin [illegible] from local [illegible]

resting upon a rather smooth surface of [illegible] surface locally on Cloverly ss but [illegible] as absent + rusty beds rest on maroon [illegible] [illegible] as part of Morrison — although they may belong to the Cloverly. * This [illegible]

R.S. Knappen + G.F. Moulton 1931 (USGS Bull. 822, pp 23-28)
(Central Southern Montana) Gives stratig. [illegible]

Cloverly as descr. by NHD but thicker and coarser.

3. local members:-

3. Rusty ferrug. ss + shale 5m. 60 ft = Greybull of type
2. Var. clays + mudstones, incl. much andesitic agglom. + very lenticular coarse brown ss. 90-240 Av. 150
1. Thick irreg. mass of black lignitic eql, + tawny yellow ss. 20-95 feet Av. 45

3. Greybull have sharply distinct. - It is partly fluvial only but upper brackish-water ss were ripmixed + indicate "detrital establishment of marine conditions."

1. Analyzed Cloverly eql = 19% Ja very [illegible] Morrison or Kootenai X beds dip southwards eql's thin N+S, lenticular to west indicated.

2. Var. unit mapped but not named. Includes pebbles, mostly pink + white quartzite. Doesn't believe they are gastroliths, neither does Stanton. Much of clay smells like Bentonite. High in colored to black. Lenses of dark green andesitic sand, thin layers bentonite,
↑
Question this — does not mention agglomerate in his extended description.

A very local, coarse brown ss, [illegible] 30 ft below top of clay. Gets up to 50 ft thick.

Includes rusty beds in base of their lower shale member of Thermopolis. They = lower 100 feet of normal prod. Includes the whole of Fall River equivalent.

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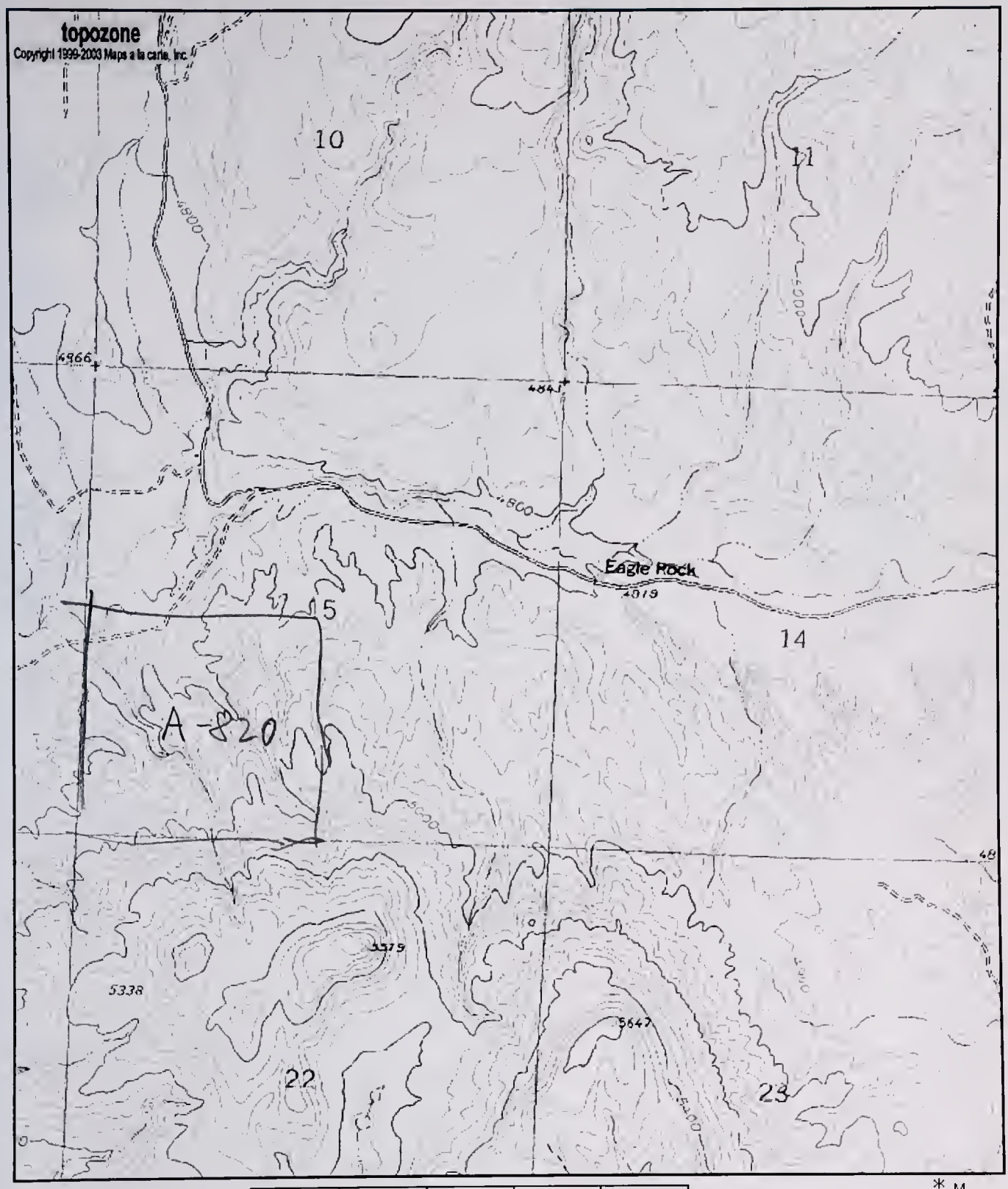
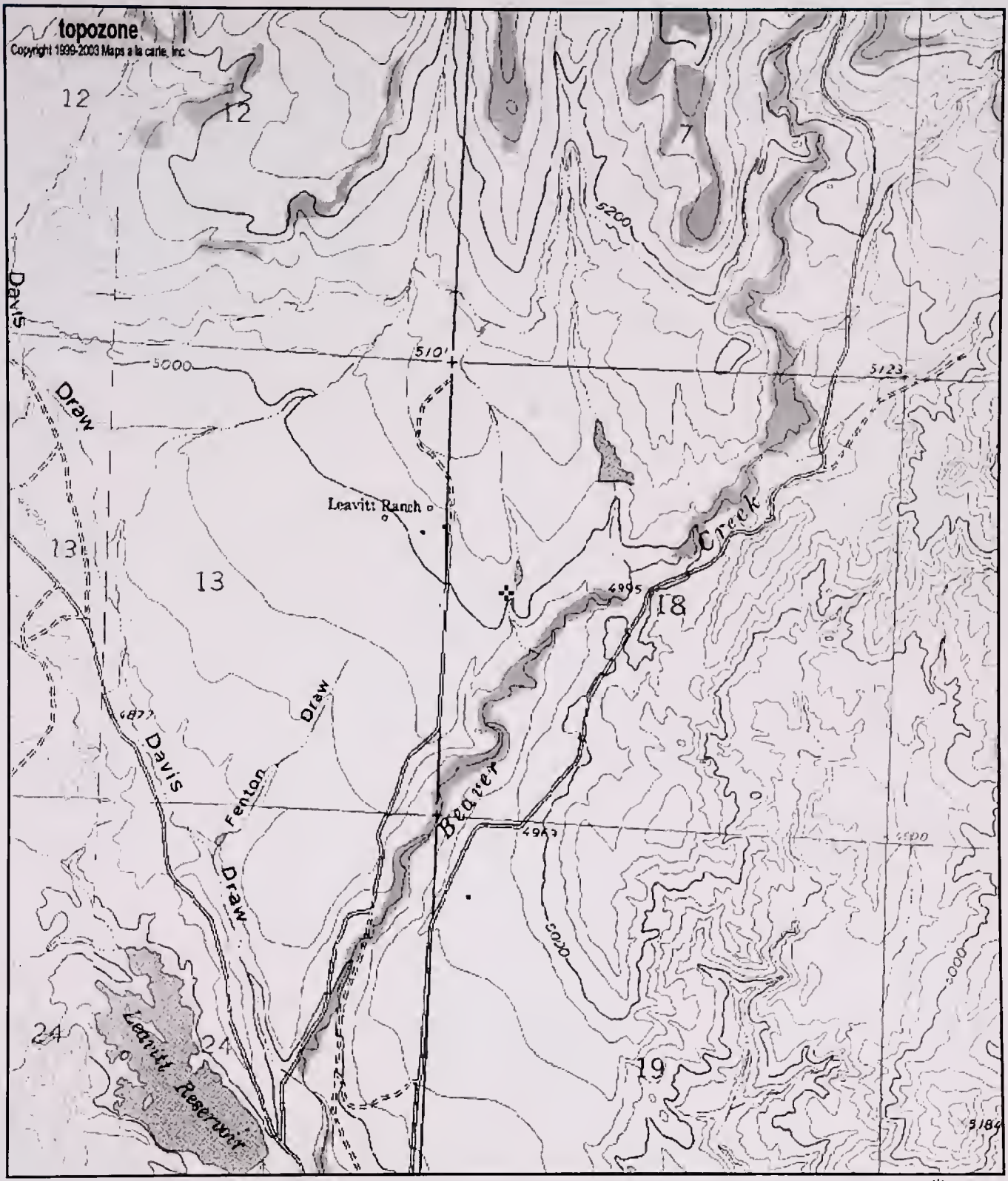


UTM 13 269807E 4948961N (NAD27)

USGS Bear Creek Ranch (WY) Quadrangle

Projection is UTM Zone 13 NAD83 Datum

M=12.261
G=-2.043



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

UTM 13 273414E 4948702N (NAD27)

USGS Leavitt Reservoir (WY) Quadrangle

Projection is UTM Zone 13 NAD83 Datum

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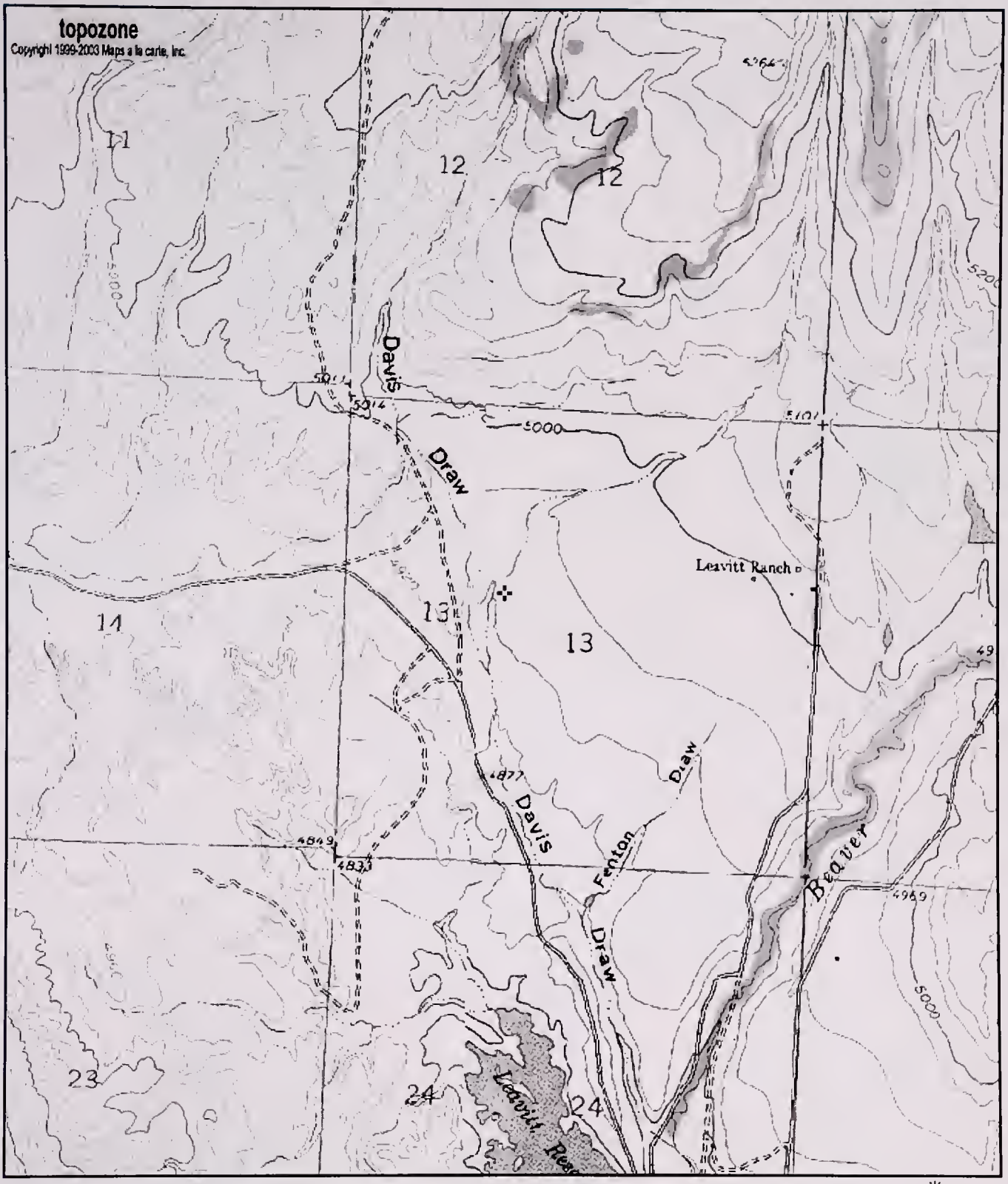
G=-2.011



0 0.3 0.6 0.9 1.2 1.5 km

0 0.2 0.4 0.6 0.8 1 mi

UTM 13 272144E 4948915N (NAD27)

USGS Leavitt Reservoir (WY) Quadrangle

Projection is UTM Zone 13 NAD83 Datum

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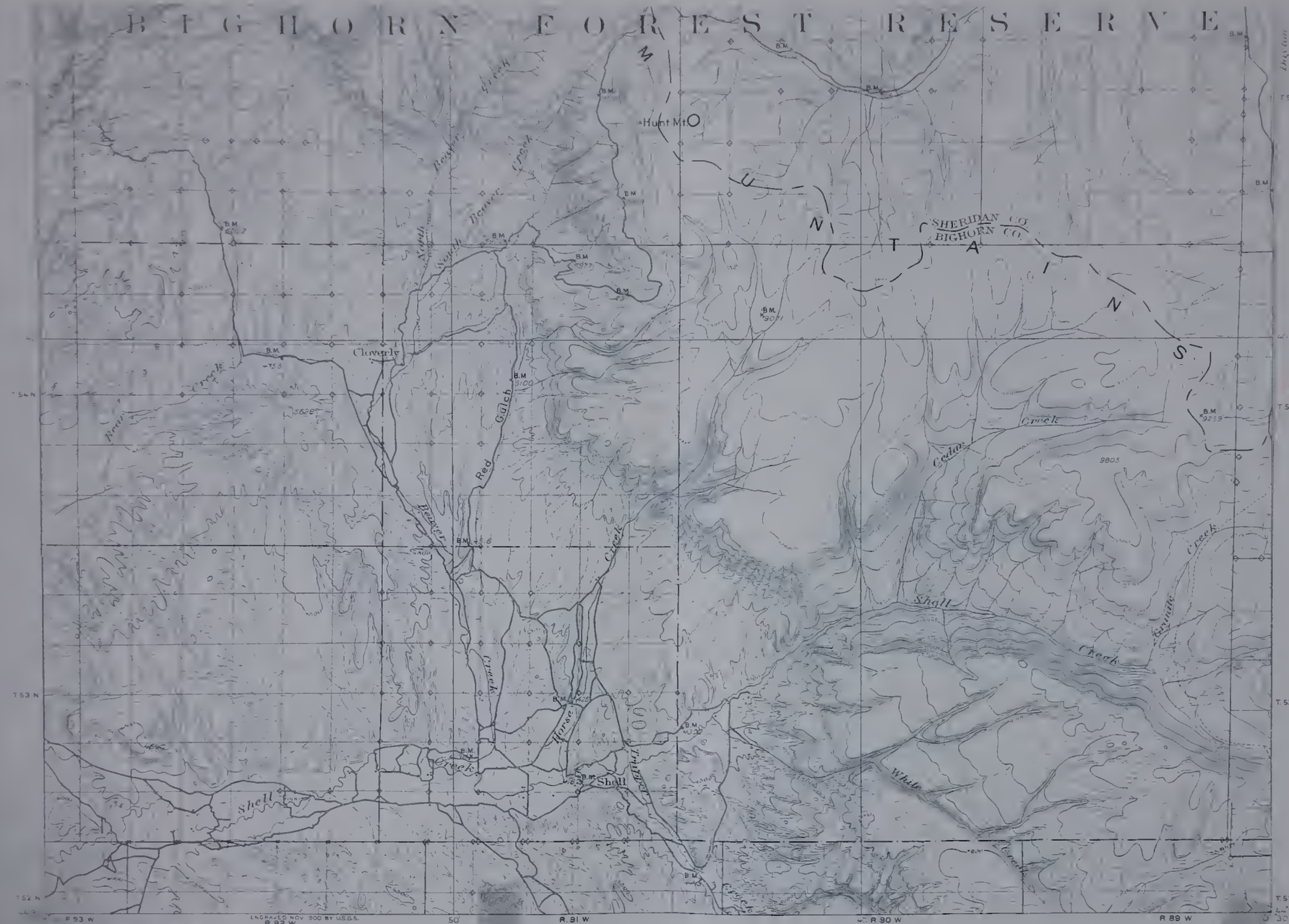

Cloverly

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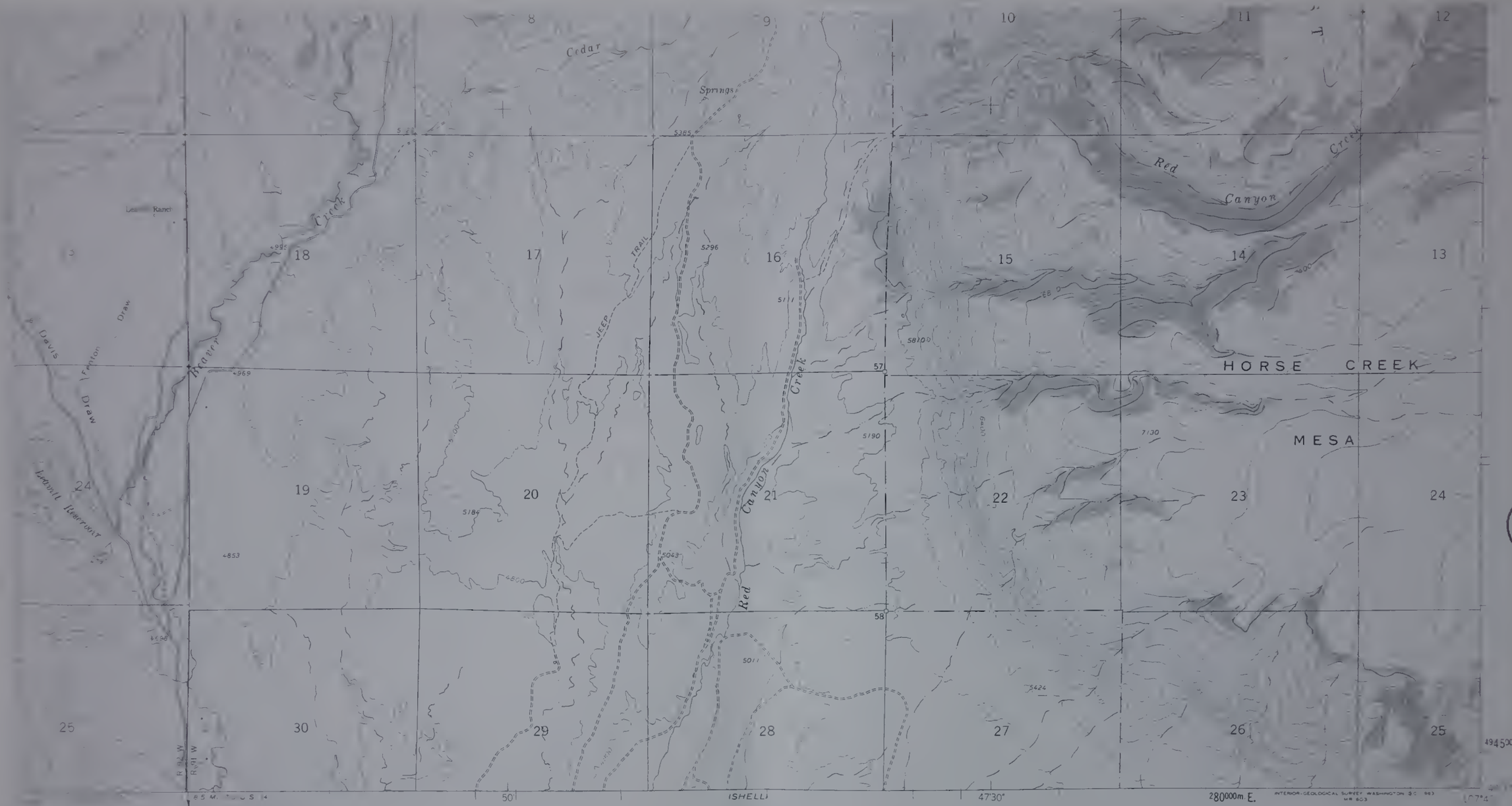
YALE UNIVERSITY

Bald Mountain, Wyo

WYOMING - MONTANA
BOUNDARY LINE
Cookstove Basin
Sheep Mt.
Devil Canyon
Cone Mt.
Duncom Mt.
Medicine Mt.
Firmanus Mill
Bald Mountain
Bald Mt.
Little Bald Mt.
Hunt Mt.
BIGHORN FOREST RESERVE
Little Horn River
Red Gulch
Stockade
West Pass Creek
Fuel
RIVER
Trail Creek
Sheridan Big Horn Co.
R. 93 W.
R. 92 W.
R. 91 W.
R. 90 W.
T. 56 N.
T. 55 N.

Doc 465



Mapped, edited and published by the Geological Survey
[illegible] Department of the Interior or program
[illegible] development of the Missouri River Basin

[illegible] metrics from aerial
[illegible] of 1960
[illegible] North American datum
[illegible] Wyoming coordinate system
[illegible] Mercator grid ticks

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

16°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1960

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A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

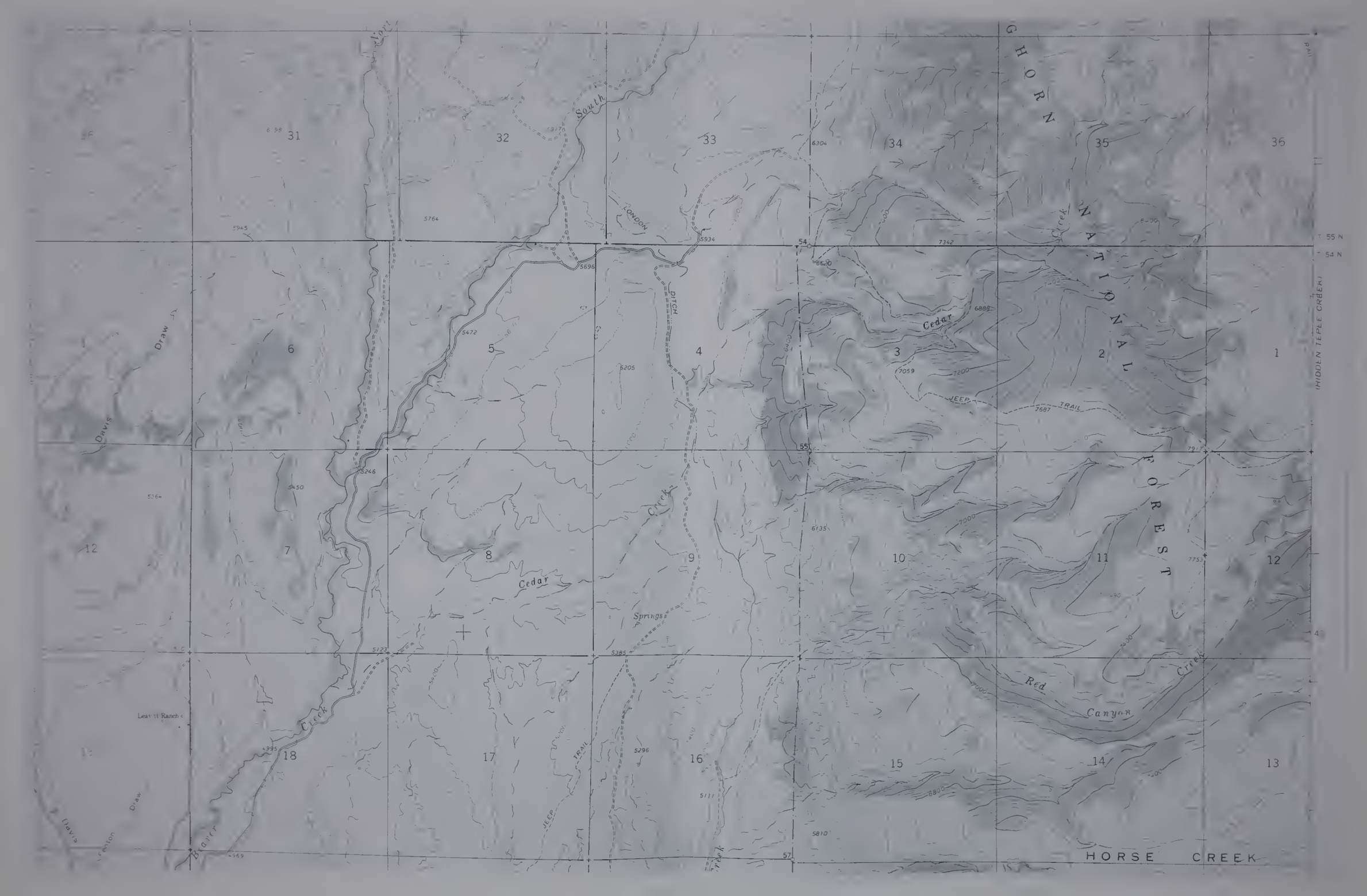
WYOMING
QUADRANGLE LOCATION

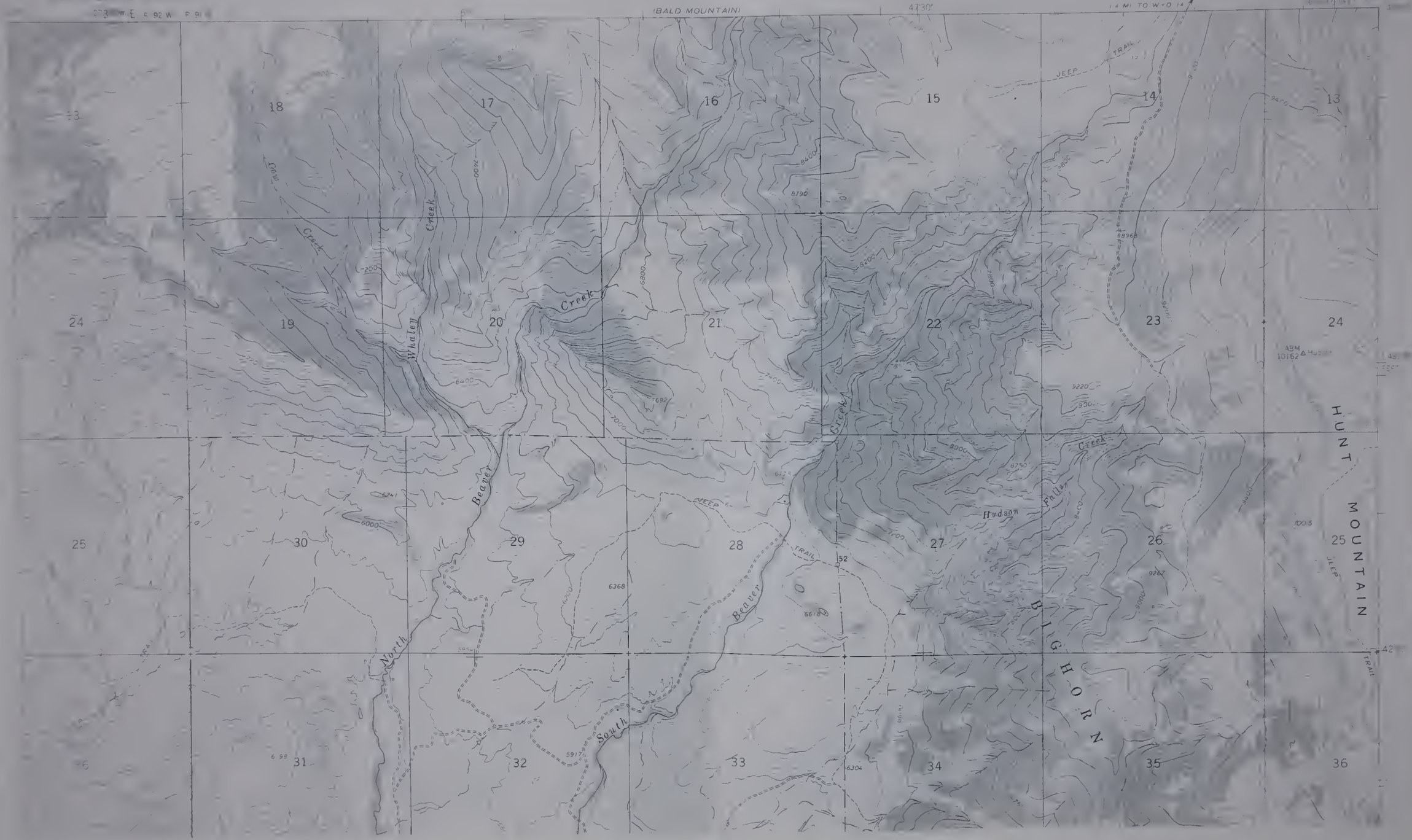
ROAD CLASSIFICATION
Light-duty
Unimproved dirt

LEAVITT RESERVOIR, WYO

N4345 W10745/7.5

1960


GHORN
NATIONAL
FOREST
South
Draw
Davis
Cedar
Creek
Red
Canyon
Springs
DITCH
JEEP
TRAIL
HORSE CREEK
(HIDDEN TEPEE CREEK)
T 55 N
T 54 N


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
LEAVITT RESERVOIR QUADRANGLE
WYOMING-BIGHORN CO
7.5 MINUTE SERIES (TOPOGRAPH
(BALD MOUNTAIN)
47'30"
14 MI TO W-O 14
TRAIL
JEEP
Creek
Whale
Beaver
North
South
Hudson
Falls
HUNT
MOUNTAIN
BIG
HORN
ABM
10162
18
17
16
15
14
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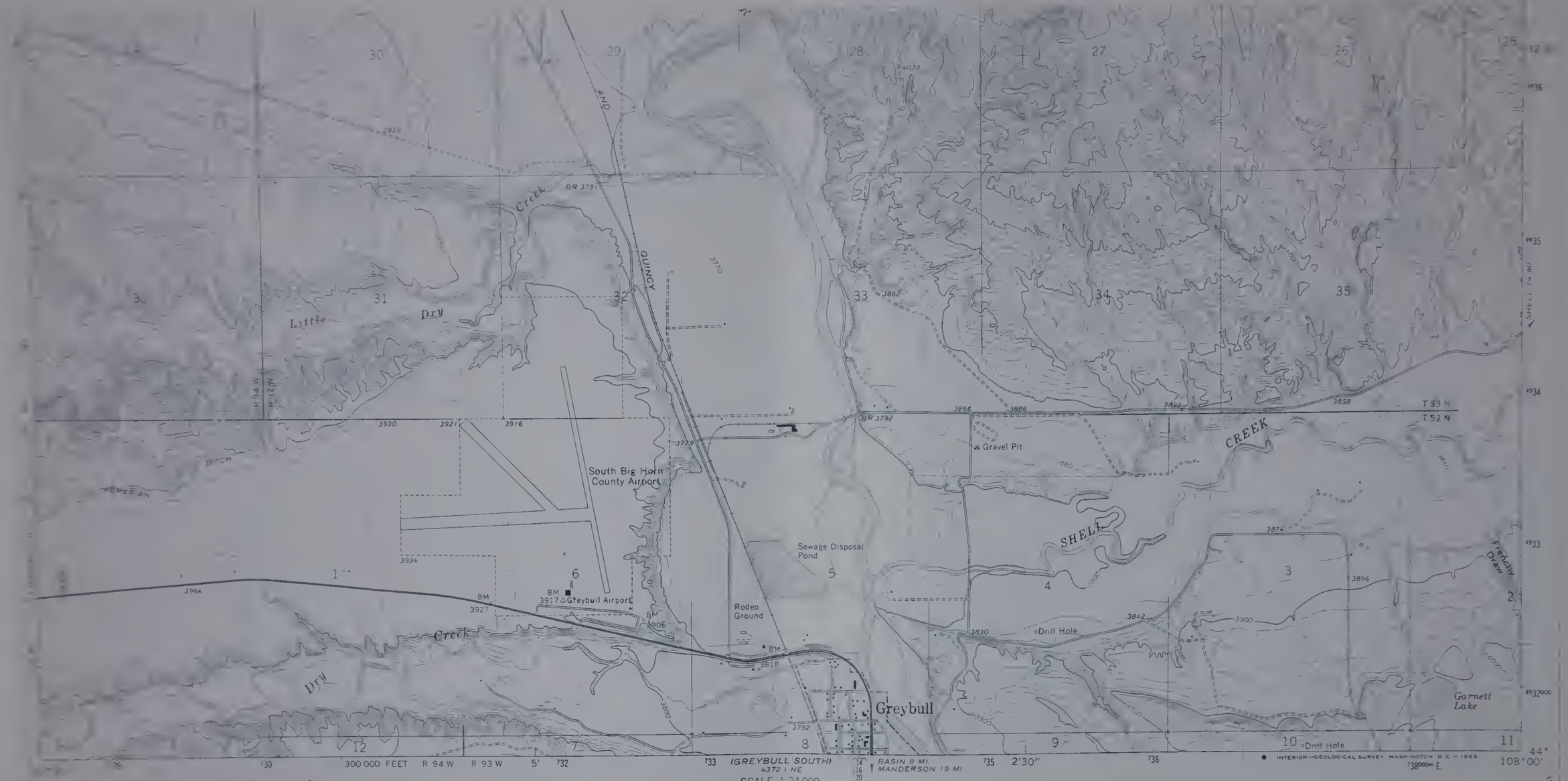
36



Mapped, edited and published by the Geological Survey

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1964. Field checked 1966

Polyconic projection. 1927 North American datum

10,000-foot grid based on Wyoming coordinate system, east zone

1000-meter Universal Transverse Mercator grid ticks, zone 12

Fine red dashed lines indicate selected fence lines

Land classification boundaries shown in areas of extensive tract surveys

SCALE 1:24 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 5 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

GN MN
2°04' 37 MILS
16° 284 MILS
UTM GRID AND 1966 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

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DEC 29 1969
YALE UNIVERSITY

WYOMING
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy duty ——— Light duty ———
Unimproved dirt ========
U S Route

GREYBULL NORTH, WYO.

N4430—W10800 7 5

1966

AMS 4373 II SE—SERIES V874

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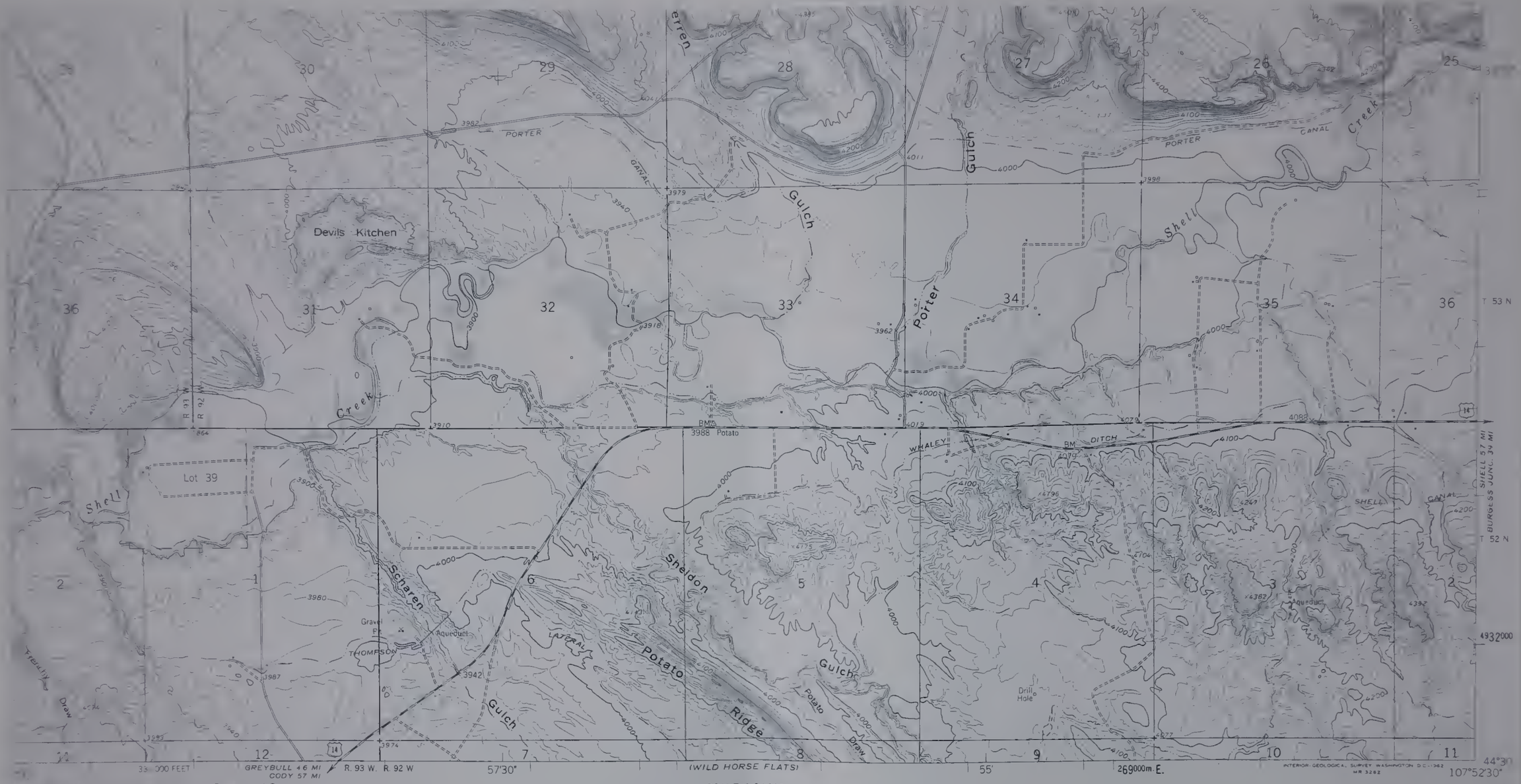
Strip Mines
MOUNTAIN
Drill Hole
Drill Hole
BIGHORN
CHICAGO
BURLINGTON
Porter
Draw
Gravel Pit
RIVER
AND
Creek
BR 3791
(DEVILS KITCHEN)
4471 III SW
(HEP CANYON)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
GREYBULL NORTH QUADRANGLE
WYOMING – BIG HORN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
4373 II NE
(ALKALI CREEK)
14 MI TO U.S. ALT 14 2'30"
320 000 FEET
108° 0
Bear Creek
Drill Hole
Steamship Rock
Strip Mine
Drill Hole 3845
Bear Creek
Strip Mines
SHEEP MOUNTAIN
Drill Hole
T 54 N
T 53 N
1 440 000 FEET



Mapped, edited, and published by the Geological Survey
... of the Department of the Interior program
... the development of the Missouri River Basin

...ography by USGS and USC&GS

...graphy by photogrammetric methods from aerial ... 1957 1958. Field checked 1960

...ontal control is 1927 North American datum
...ical grid based on Wyoming coordinate system ...
...ne zone
...universal Transverse Mercator grid ticks ...
...ue

SCALE 1:24000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Medium duty — Light duty
Unimproved dirt
U.S. Route

16°
TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1960

WYOMING
QUADRANGLE LOCATION

DEVILS KITCHEN, WYO.

N4430—W10752.5/7.5

1960

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Herren
Porter
Gulch
Claypit
Drill Hole
JEEP TRAIL
Claypit
Claypit
Claypit
Claypit
Herren
Gulch
PORTER
CANAL
PORTER
CANAL
Creek
Shell
Devils Kitchen
12
7
8
9
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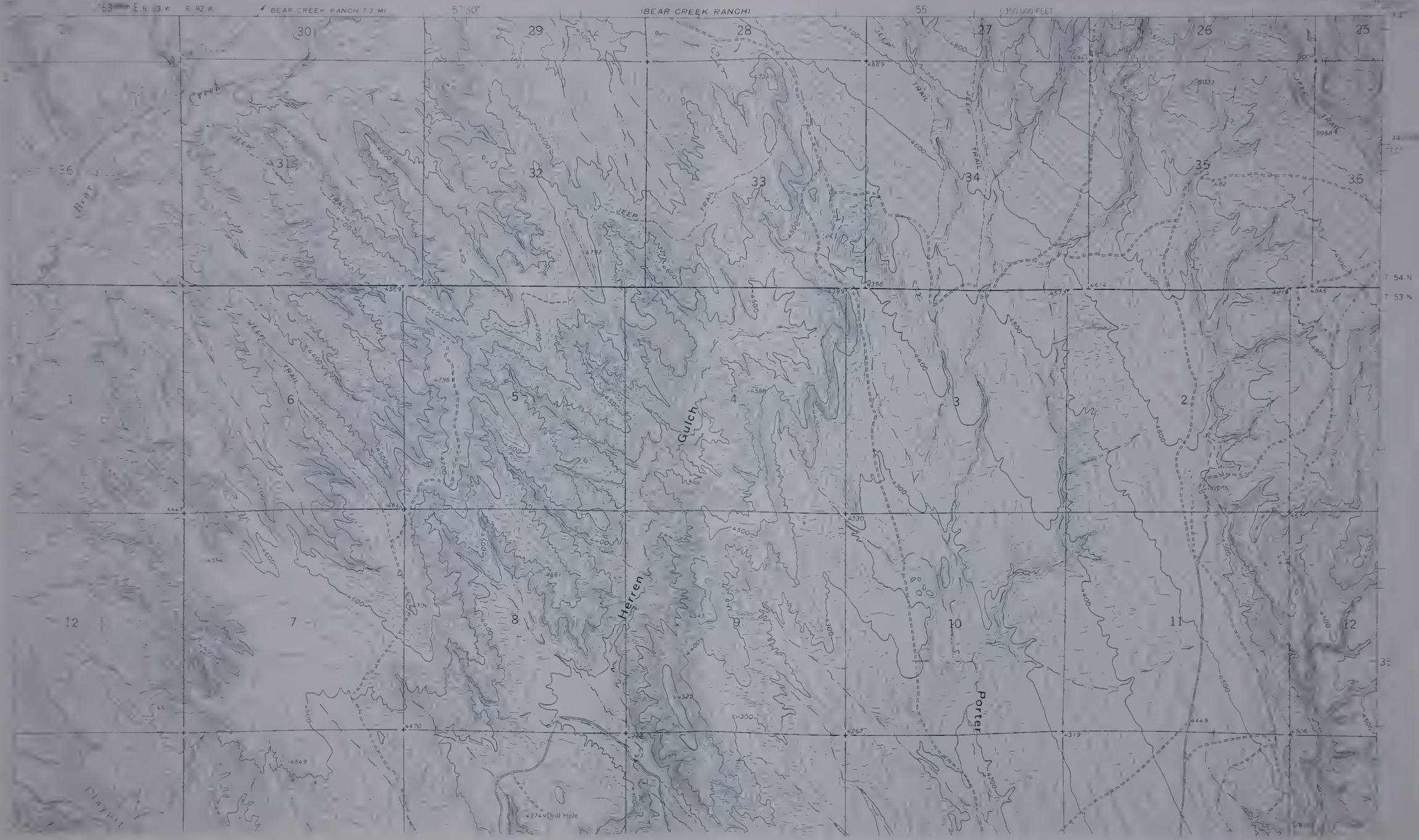
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
DEVILS KITCHEN QUADRANGLE
WYOMING-BIG HORN CO
7.5 MINUTE SERIES (TOPOGRAPHIC)
BEAR CREEK RANCH 7.3 MI
(BEAR CREEK RANCH)
Herren Gulch
Porter
Drill Hole
T 54 N
T 53 N

doc 2-15